CLAIMS:

1. A method of encoding a sequence of frames, composed of picture elements (pixels), by means of a three-dimensional (3D) subband decomposition involving a filtering step applied, in the sequence considered as a 3D volume, to the spatial-temporal data which correspond in said sequence to each one of successive groups of frames (GOFs), these GOFs being themselves subdivided into successive pairs of frames (POFs) including a so-called previous frame and a so-called current frame, said decomposition being applied to said GOFs together with motion estimation and compensation steps performed in each GOF on saids POFs and on corresponding pairs of low-frequency temporal subbands (POSs) obtained at each temporal decomposition level, this process of motion compensated temporal filtering leading in the previous frames on the one hand to connected pixels, that are filtered along a motion trajectory corresponding to motion vectors defined by means of said motion estimation steps, and on the other hand to a residual number of so-called unconnected pixels, that are not filtered at all, each motion estimation step comprising a motion search provided for returning a motion vector that minimizes a cost function depending at least on a distorsion criterion involving a distortion measure, said measure distorsion being also applied to the set of said unconnected pixels.

2. An encoding method according to claim 1, in which said motion search is provided for returning the motion vector that minimizes the following expression (1) :

$$J(\mathbf{m}) = SAD(s, c(\mathbf{m})) + \lambda_{MOTION} \cdot R(\mathbf{m}-\mathbf{p}) \quad (1)$$

where $\mathbf{m} = (m_x, m_y)^T$ is the motion vector, $\mathbf{p} = (p_x, p_y)^T$ is the prediction for the motion vector, λ_{MOTION} is the Lagrange multiplier, the rate term $R(\mathbf{m}-\mathbf{p})$ represents the motion information only, SAD used as distortion measure is computed as :

$$SAD(s, c(\mathbf{m})) = \sum_{x=1, y=1}^{B,B} \left| s[x,y] - c[x-m_x, y-m_y] \right| \quad (2)$$

s is the original video signal, c is the coded video signal and B is the block size, characterized in that the distorsion criterion extends equation (1), taking into account the unconnected pixels phenomenon for the minimizing operation that is applied to the following expression (3) :

$$K(\mathbf{m}) = J(\mathbf{m}) + \lambda_{UNCONNECTED} \cdot D(S_{UNCONNECTED}(\mathbf{m})) \qquad (3)$$

in which $D(S_{UNCONNECTED}(\mathbf{m}))$ is the distortion measure for the set $S_{UNCONNECTED}$ of unconnected pixels resulting from the motion vector $\mathbf{m}$.

3. An encoding method according to claim 2, characterized in that it includes, for taking into account the distortion due to the unconnected pixels, the following steps, successively applied to each part of the whole image to be motion-compensated:

(a) for the considered part of the image and for a given motion vector candidate m, a temporary inverse motion compensation is applied;

(b) the set of unconnected pixels is identified;

(c) $D(S_{UNCONNECTED}(m))$ is evaluated;

(d) the current K(m) value is computed and compared to the current minimum value $K_{min}(m)$ to check if the motion vector candidate brings a lower K(m) value;

(e) when all the candidates have been tested, a final inverse motion compensation is applied to the best candidate;

(f) the steps (a) to (e) are then applied to the next part of the image that can be similarly processed, said part of the image being a pixel, a block of pixels, a macroblock of pixels or any region provided that the set of parts covers the whole image without any overlapping.

4. An encoding method according to claim 2, characterized in that it includes, for taking into account the distortion due to the unconnected pixels and minimizing the global criterion $\sum$ [all parts]K(m) for the whole image to be compensated, the following steps:

(a) the optimal motion vector m_{opt} is computed, as well as a set of $N_{sub\text{-}opt}$ sub-optimal motion vectors $\{m_{sub\text{-}opt}\}$ that provide the minimum values for J(m);

(b) for all these vectors, the corresponding value for the criterion J(m) is stored, in order to generate $J(m_{opt})$ and $\{J(m_{sub\text{-}opt}\}$;

(c) an inverse motion compensation is applied for the optimal motion vectors m_{opt}, in order to compute $\sum$ [all parts] $K(m_{opt})$;

(d) from the list of sub-optimal vectors, the candidate motion vector $m_{candidate}$ minimizing $|\{J(m_{opt}\} - \{J(m_{candidate})\}|$ is selected;

(e) for the set of optimal motion vectors and the candidate vector, an inverse motion compensation is applied, in order to compute again $\sum$ [all parts] K(m);

(f) if the value of $\sum$ [all parts] K(m) is lower than $\sum$ [all parts] $K(m_{opt})$, the optimal value of m_{opt} is replaced by $m_{candidate}$, for the corresponding part of the image;

(g) finally, $m_{candidate}$ is discarded from the list of sub-optimal vectors;

(h) a new candidate is selected, and the same mechanism is then applied until the list of sub-optimal vectors is empty, in order to obtain the optimal set of motion vectors.

5. A computer programme comprising a set of instructions for the implementation of a method according to anyone of claims 3 and 4, when said programme is carried out by a processor included in an encoding device.